



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/926,160	12/14/2001	Shinichi Nonaka	011145	4237

23850 7590 03/28/2005

ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP  
1725 K STREET, NW  
SUITE 1000  
WASHINGTON, DC 20006

EXAMINER	
WACHTEL, ALEXIS A	
ART UNIT	PAPER NUMBER
1764	

DATE MAILED: 03/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/926,160

**Applicant(s)**

NONAKA ET AL.

**Examiner**

Alexis Wachtel

**Art Unit**

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 2-15-05.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 5-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 5-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***Detailed Action***

***Response to Amendment***

1. Applicant's amendment and accompanying Remarks filed 2-15-2005 have been entered and carefully considered.

The amendment is insufficient to overcome the obviousness rejections of claims 1,5-8.

2. Claims 1 and 5-8 rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,316,089 to Ohtani et al in view of US 5,847,036 to Takabatake et al as set forth in section 4 of the previous office action.

Ohtani et al disclose a sheet form photocurable material comprising:

- (a) a polymerizable unsaturated monomer (Col 10, lines 20-22);
- (b) a polymer which is either polymethyl methacrylate or a polymer consisting mainly of methyl methacrylate units and which is compatible or swollen with the monomer (a) (Col 22, lines 11-15);
- (c) a photocuring agent (Col 3, lines 9-12);
- (d) fibrous reinforcement (Col 3, lines 3-4);
- (e) one or more resins selected from a (meth)acrylic polymer, an unsaturated polyester, a vinyl ester or a urethane acrylate (Col 8, lines 51-52);

wherein, the polymerizable unsaturated monomer (a) is an acrylic polymerizable monomer, and has a solubility parameter SP within a range from 8.1 to 10.0, which is calculated in accordance with a formula " $SP = \sum(G)/\text{molecular weight}$ " by using molar attraction constants G, and a content of the polymer (b) is within a range from 10 to 50

Art Unit: 1764

parts by weight, relative to 100 parts by weight of the polymerizable unsaturated monomer (a). The Examiner wishes to note that the Applicant's own admission demonstrates that methyl methacrylate has a solubility parameter SP value of 8.34 (Specification on pp.5 and 6) which is the same material used as the polymerizable unsaturated monomer by Ohtani et al per the above disclosure.

A photocurable sheet-form material wherein the polymer (b) is included in an amount of 1 to 100 parts by weight, relative to 100 parts by weight of the polymerizable unsaturated monomer (a) (Col 10, lines 10-15).

A layered molding made of a laminate of a thermoplastic resin sheet and a photocurable sheet-form material (Col 28, lines 5-38).

A method of reinforcement, including a step of using a photo-curable sheet-form material according to claim 1 on a surface of a molded article (Col 28, lines 5-38).

Per claims 1 and 8, Ohtani et al fail to teach that polymer (polymethyl methacrylate) (b) is produced in a powdered form having a weight average molecular weight of 100,000 or more or that polymethyl methacrylate is produced in an emulsion form by an emulsion polymerization method. Additionally with respect to claim 1, Takabatake et al do not teach the claimed particle diameter of polymer B.

Takabatake et al is directed to (meth)acrylic molding material and teaches a (meth)acrylic polymer that is preferably made of methyl methacrylate monomers. The (meth)acrylic polymer can be made by emulsion polymerization. The (meth)acrylic polymer can have a weight average molecular weight of between 30,000 and 1,000,000 (Col 4, lines 27-42). Since Ohtani et al teach the use of a polymethyl

Art Unit: 1764

methacrylate polymer as does Takabatake et al, it would seem plausible to assume that polymethyl methacrylate has the claimed weight. Additionally, in view of Takabatake et al, it would have been obvious to one of ordinary skill at the time the invention was made to have made the polymethyl methacrylate polymer by using a well know and cost effective polymerization means such as emulsion polymerization. Additionally, since Takabatake teaches the use of an emulsion polymerization method, the claimed size range of methylmethacrylate would have been inherently provided due to the use of identical methodology. Additionally, it is critical to note that Takabatake et al was relied on merely for the purpose of disclosing the desirability of making polymethyl methacrylate by an emulsion polymerization method. Applicant auxiliary arguments regarding the specific application of polymethyl methacrylate polymer made by emulsion polymerization as disclosed in the Takabatake et al reference is irrelevant.

### ***Arguments***

3. Applicant argues that polymethyl methacrylate as disclosed by Ohtani et al is used as a low shrinkage agent whereas the instant application uses polymethyl methacrylate to increase viscosity. However, it is noted that the specific use for components is not seen to structurally differentiate the claimed article over the prior art.

Applicant argues that the polymethyl methacrylate of Ohtani et al is an ordinary one and would be obtained by suspension polymerization. Applicant has failed to provide any evidence of this. Accordingly, Applicant's assertion is not seen to be persuasive. In particular, Applicant alleges that the polymethyl methacrylate used by

Art Unit: 1764

Ohtani et al would have a particle diameter of 1mm or more despite not having any evidence for the assertion.

Additionally, Applicant argues that Ohtani et al discloses that thickening is performed by pre-polymerization with a specified visible light absorbing dye and visible light polymerization initiator. Examiner notes that Ohtani et al must merely disclose Applicant's claimed structure which Ohtani et al does, therefore Applicant's arguments are found to be unpersuasive.

Applicant argues that the prior art combination does not teach that polymethyl methacrylate has the claimed SP value. However, Applicant does demonstrate in the instant Application's specification that polymethyl methacrylate has the claimed SP values. Since the polymethyl methacrylate disclosed by the prior art and Applicant are identical, Applicant admits that claimed SP values of polymethyl methacrylate are disclosed in the prior art.

With respect to Claim 1, Applicant argues that Takabatake et al teaches the "bulk polymerization" is preferable for making polymethyl methacrylate. Applicant therefore concludes that Takabatake does not teach the use of emulsion polymerization for making polymethyl methacrylate. However, Takabatake et al is not limited to using bulk polymerization and does in fact enable for the use of an emulsion polymerization method for making polymethyl methacrylate.

### ***Conclusion***

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex Wachtel whose telephone number is 571-272-

Art Unit: 1764

1455. The examiner can normally be reached on 10:30am to 6:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Glenn Caldarola, can be reached at (571)-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Glenn Caldarola  
Supervisor, Patent Examiner  
Technology Center 1700